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SOME REMARKS ON HELLENISTIC INFLUENCE UPON THE FORTIFICATION OF NORTHEASTERN IRAN IN THE ARSACID PERIOD¹

When Alexander and his army conquered the Achaemenian empire, a new phase in the history of the Near East and Central Asia began. Many cities and military garrisons founded by Alexander and his successors in the East kept the Graeco - Macedonian realm together and were centres of "Hellenization", both politically and culturally². The problem of the interaction between the new Greek culture and Oriental traditions has been much discussed³. Seleucid rule in Iran lasted more than a century and a half. The Arsacids - the heirs of the Seleucids - established their supremacy in Western Asia in the 2nd century B.C.⁴. These political and cultural changes had interesting effects on fortification which is the main concern of this paper.

To the east of the Euphrates, Media⁵ became the centre of Hellenism for western Iran as Bactria⁶ was for eastern Iran and Central Asia. The Media - Bactria route was of crucial significance both for the Seleucids and for the Arsacids. The area of northeastern Iran - in fact, the only line connecting Syria and Mesopotamia with Central Asia - acquired an exceptional importance as a key to control the "upper satrapies". Unfortunately, our knowledge of the role played by the Greeks and Macedonians in the civilization development of northeastern Iran under the Seleucids and the Arsacids is still insufficiently examined. It is mainly due to the meagre advancement of archaeological investigations and the scarcity of ancient written sources⁷. This pertains also to fortification in the Seleucid and Arsacid epochs.

The last decades saw the appearance of many syntheses devoted to the subject of the ancient Greek fortifications and siegecraft⁸. Very important advances have been made in the investigations of the Hellenistic defensive

structures in Western and Central Asia ⁹. On the other hand, the local traditions of fortification in Central Asia has recently become the subject of many studies ¹⁰. The history of Parthian fortification presents a special problem since the evidence on which it must be based is still meagre and fragmentary ¹¹. Nevertheless, even in the present state of knowledge it is worthwhile to try to establish to what extent the Greeks imposed their own concepts in the military architecture (and siegecraft) of Parthian Iran and how the Parthians accepted these elements. Any serious study of Parthian fortification should take into account the Hellenistic contribution to its development.

Already the earliest Arsacids displayed their understanding to the development of the art of fortifying and attached great importance to the erection of fortifications and strongholds ¹². Fortified centres made the dynasty's basis in the course of the process of internal consolidation of the kingdom, at the same time having become the elements of defence system against the aggression of the neighbouring powers (the Seleucid monarchy, Graeco - Bactria, the nomads of Central Asia) ¹³. Of exceptional importance for the study of Parthian fortification is the fragment of Polybius' relation on the attack made by the army of Antioch III against Syrinx of Hyrcania:

(...) There were three moats, each not less than thirty cubits broad and fifteen deep, and each defended at its edge by a double row of palisades, and behind all there was a strong wall.(...) ¹⁴

In spite of defenders' sallies, the Greeks filled up the moats and breached the wall, thus capturing the city. From Polybius' account appears beyond doubt that the fortifications of Syrinx were built exactly in accordance with the requirements of Hellenistic fortification theory ¹⁵. In keeping with it, the city was protected by three rings of moats with palisades and a proteichisma. In the entire Greek world, only few cities were so completely equipped ¹⁶. It seems very probable that Syrinx was strengthened by Greek engineers in Parthian service ¹⁷.

During the Arsacid age, rectangular or square plans of urban foundations and fortresses became widespread in the region of northeastern Iran. One of the earliest structures of the kind was the fort at Hecatompylos, dated by its explorers to the early Arsacid phase ¹⁸. A rectangular plan, large inner court and quadrangular towers projecting at the corners are the elements well known from Greek fortresses, e. g. from Failaka, Theangela and Prinias ¹⁹. Suchlike

defensive structures were unknown in the area of northeastern Iran prior to the arrival of the Greeks. The phase embracing 7th - 4th centuries B.C. in Parthia and Margiana was dominated by the central configuration structures, approximating the circle or irregular (Jaz-depe, Erk-kala, Elken-depe) ²⁰. In the Arsacid epoch, rectangular or square arrangements enjoyed particular popularity in Margiana (Akča-depe, Gābekly, Dev-kala, Syčannyk) ²¹. This resulted from the stronger Hellenization of this area which in the wake of overthrowing the Seleucid power there had been remaining within the borders of Graeco - Bactria for a long time ²². Merv - the city of Margiana - was one of the greatest foundations in northeastern Iran ²³. It was Antiochus I who definitely changed Merv into a Hellenistic city which received a regular square plan with main streets crossing at the centre ²⁴. The lower town (Gjaur-kala) was protected by a huge mud-brick wall ca. 7.5 km in length. The old citadel (Erk-kala) was included in the new enclosure. In Parthia proper, the first regular urban foundation was Dengil-depe dating back to about 2nd century B.C. (square town and rectangular suburb) ²⁵. The fortress of Dašly 6 had a square outline, whereas the city of Kunja-Kaachka was nearly rectangular in plan ²⁶. In Hyrcania, Gabri Qaleh, Qaleh Kharabeh, Qaleh Gug A and Qaleh Daland were designed on a square plan ²⁷. The forts at the Wall of Alexander were either rectangular or square ²⁸. The diffusion of regular plans of urban foundations and fortresses took place in the wake of Graeco-Macedonian conquest not only in northeastern Iran but also in the neighbouring regions of Bactria and Khwarazm ²⁹.

One of the most impressive constructions in the Gurgan Plain is the barrier-wall known as Alexander's Wall. The wall runs eastwards from the southeastern corner of the Caspian Sea for a distance of more than 180 km, ending in the Khorassan- Mountains. Against the south side of the wall are ca. 40 forts ³⁰. The Parthians were responsible for creating the Alexander's Wall but the idea was probably borrowed from the Greeks; a long time before the Arsacids, Antiochus I built a huge barrier-wall around the Merv oasis to defend Margiana from the raids of nomads and to protect the fertile soil from quicksand of the Karakum desert. The whole rampart was ca. 250 km long. Small adjoining enclosures - known in the area of Saryj Kišman and Odunči - may have been the guards' quarters ³¹.

Under the Arsacids, a sun-dried brick was used in northeastern Iran for the construction of fortifications, which had the dimensions of some 40 - 43 x 40 - 43 x 10 - 15 centimetres. Suchlike building material is familiar, among others, from Old and New Nisa, Arman-kala, Caš depe, the Wall of Alexander,

Dasht Qaleh and Hecatompylos ³². The comparison of sorts of building material used in the Achaemenian, Seleucid and Arsacid periods indicates that the introduction of square bricks followed Graeco - Macedonian conquest ³³. A transition from rectangular bricks - which were characteristic of the Achaemenian epoch - to square ones is particularly visible in Merv ³⁴. According to A. W. Lawrence, at least since the 5th century B.C. in Greece bricks were used having the dimensions of 40 - 50 x 40 - 50 x 8 centimetres ³⁵. Parthian constructors took similar standard of bricks after their Seleucid forerunners. In the Seleucid and Arsacid periods, it became common in the entire Near East from Mesopotamia to Khwarazm and India ³⁶.

In some fortified centres of the Arsacid epoch, a platform used to have been employed that was considerably advanced in front of the façade, thus hampering access for the attacking enemy. In Merv, at the 2nd - 1st century wall, such a platform was situated 8.5 m before the curtain ³⁷. In Old Nisa, the location of the fortress on a geological outlier was used to level the latter and raise it by means of earthworks and brick layers. In this way, an elevated and inaccessible platform came into existence ³⁸. The use of such like constructions was characteristic of Hellenistic fortification and ensued from the threat posed to defences by still better and better siege machines. In the 4th century B.C. Athens had a platform advanced 9.35 m before the city wall ³⁹. In Seleucid Merv the defence wall was situated on a 3 m - high ground course which was advanced 2 m before its façade ⁴⁰. Similar platforms were widespread in Central Asia in the 3rd - 1st centuries B.C., i. e. in the Hellenistic and post - Hellenistic phases (Samarkanda, Chirchik, Keles-Kobad-Sach, Baktra, Dalverzin-tepe) ⁴¹.

According to the principles of Hellenistic fortification, towers made the important points of resistance in the defence of fortifications, with the majority of artillery placed in them ⁴². These guidelines were partially adopted by the Parthians. In Old Nisa in a tower no. 1 a 3.45 x 6 m chamber has been discovered for housing the machines, with piles of stone missiles in it ⁴³. Regarding their importance, the towers were particularly exposed to enemy's attacks. As a rule then, in Hellenistic defences their ground - storeys were solid in order to provide protection against battering rams, and also to bear the weight of machines on upper storey ⁴⁴. Such design was employed in the tower no.1 in Old Nisa ⁴⁵ and in the northwestern tower in Durnali ⁴⁶. It is noteworthy that in the latter case the tower was not constructionally connected with the curtains, what is commonly known in the case of Greek fortifications. The principle of dominating role of towers in

defence was carried into effect in different ways. Old Nisa had as many as 44 towers situated in average every 25 - 30 m ⁴⁷, in Durnaii the towers were erected every 10 - 17 m ⁴⁸, in Dengli-depe every 30 m ⁴⁹, in Syčannyk every 25 - 30 m ⁵⁰.

When reinforcing gateways, Greek constructors paid attention not only to the possibilities of their static defence but also endeavoured to design the access in a way that would render enemy's approach to its surroundings extremely difficult. In this case, the guideline was a principle formulated by Philo of Byzantium, according to which the enemy approaching the gate should be forced to expose their right, thus unprotected side, towards the walls ⁵¹. This principle was employed in Old Nisa. The original access to the fortress was by means of a 200 m-long ramp along the wall to the southwestern tower ⁵². In the citadel of Merv (Erk-kala) the access was similar, yet it is not certain whether this was constructed under the Arsacids, or earlier ⁵³.

The analysis of the fortification of northeastern Iran in the Arsacid period proves that main elements of the Hellenistic defensive strategy were known there, i. e. - besides the defence of walls - the employment of outer defences (that were purely Hellenistic in form in Syriax) and sallies to prevent the enemy from approaching too close. These elements were also enriched by another immensely important component, i. e. the use of artillery. On many Parthian sites large amounts have been discovered of clay or stone missiles weighing up to 10 kgs (among others, in Merv, Old Nisa and Igdykaia) ⁵⁴. This invention was also borrowed by the Parthians from the Greeks.

Developments in techniques of fortification were obviously closely connected with the art of poliorcetics. Throughout the Arsacid epoch, the Parthians were constantly developing means of defence. That, in turn, depended upon methods of siege-warfare which armies of neighbouring peoples employed. When besieging Parthian cities and strongholds in Mesopotamia, the Romans used very sophisticated techniques of siege-warfare. Quite different methods of attack characterized the nomads of Central Asia who threatened the Arsacid rule in northeastern Iran. Accordingly, apart from common features, there were also essential differences in the development of fortification in the various areas of the Parthian empire.

The constructors of the Parthian fortifications must have taken into account the possibility of using the sophisticated methods by the besieging army, including particularly the employment of various siege machines. Considering this factor it is easy to comprehend the reason why the Parthians adopted so quick the prime idea of the Hellenistic defensive strategy that

consisted in keeping the enemy at a distance from ramparts ⁵⁵.

To analyse the Parthian fortification of northeastern Iran properly, one should pay attention also to a local tradition of military architecture. Many Arsacid defensive structures were mixtures of Oriental and Hellenistic elements. For example, the plans of many cities, strongholds and forts in Parthia follow a Greek development, but whilst the Parthian architects built these ramparts according to a Hellenistic layout, they also introduced some typically Oriental modifications - e. g. the employment of many apertures for missiles and corridors in walls which was very characteristic of the Oriental military architecture ⁵⁶.

The data quoted above testify to the considerable influence of the Hellenistic thought upon the development of Parthian fortification in northeastern Iran under the Arsacids. Despite political changes, some Hellenistic ideas and achievements in fortification continued to be popular during the whole Arsacid period.

NOTES

1. The present paper is based on my M.A. thesis entitled The Military Architecture of Northeastern Iran in the Arsacid Period (3rd Century B.C. - 3rd Century A.D.) and prepared under the guidance of Prof. J.Ostrowski (Jagiellonian University, Institute of Archaeology, Cracow 1989). I use the term "northeastern Iran" as a historical designation concerning the state of affairs in the Seleucid and Arsacid period. In this sense it denotes the combined regions of Hyrcania, Parthia proper, and Margiana (i. e. northeastern part of the contemporary Iranian state and southern Turkmenistan). Cf. G. A. K o Ź e l e n k o, Parfijskaja fortifikacija, Sovetskaja archeologija 1963, 2, p. 57; i d e m, K ocenke dostovernosti antičnoj tradicii ob ellinističeskim gradostroitelstve na Vostoke (na primere Midii, Girkanii, Parfii), Kratkie soobščeniia Instituta archeologii, vyp. 136, 1973, p. 24; i d e m, Rodina parfian, Moscow 1977, p. 20; M. Y. K i a n i, Parthian Sites in Hyrcania: the Gurgan Plain, Berlin 1982 (= Archäologische Mitteilungen aus Iran, Ergänzungsband 9), p. 9; V. G. L u k o n i n, Political, Social and Administrative Institutions, Taxes and Trade (in:) The Cambridge History of Iran, vol. 3(2), ed. E. Y a r s h a t e r, Cambridge 1983, p.734.

2. The problem of the foundation and the development of Greek colonies in Iran and Central Asia has been a major concern for historians - cf. among others: V. T s c h e r i k o v e r, Die hellenistischen Städtegründungen von Alexander dem Grossen bis auf die Römerzeit, Leipzig 1927 (= Philologus, Supplementband XIX, Heft I), pp.96 - 106; W. W. T a r n, The Greeks in Bactria and India, Cambridge 1951; G. M. C o h e n, The Seleucid Colonies. Studies in Founding, Administration and Organization, Wiesbaden 1978 (=Historia, Einzelschriften, Heft 30) pp. 18 - 19; G. A. K o Ź e l e n k o, Grečeskii polis na ellinističeskim Vostoke, Moscow 1979; E. B i c k e r m a n, The Seleucid Period (in:) The Cambridge History of Iran, vol. 3(1), ed. E. Y a r s h a t e r, Cambridge 1983, pp.3 - 20; P. B e r n a r d, Problemy grečeskoj kolonialnoj istorii i urbanizm ellinističeskogo goroda Centralnoj Azii (in:) Problemy antičnoj kultury, ed. G. A. K o Ź e l e n k o, Moscow 1986, pp. 249 - 258.

3. On these debates, see: M. W h e e l e r, Flammen über Persepolis. Alexander der Grosse und Asien, Berlin - Frankfurt 1969; D. S c h l u m b e r g e r, L'Orient hellénisé, Paris 1970; E. W i l l i, C. M o s s é, P. G o u k o v s k y, Le Monde Grec et l'Orient, Paris 1975; R. N. F r y e, The History of Ancient Iran, München 1984, pp.137ff; M. A. R. C o l l i e d g e, Greek and non-Greek Interaction in the Art and Architecture of the Hellenistic East (in:) Hellenism in the east: The interaction of Greek and non - Greek Civilizations from Syria to Central Asia after Alexander, ed. A. K u h r t, S. S h e r w i n - W h i t e, London 1987, pp.134 - 162; i d e m, Some Observations on Greek Art in Western Asia after Alexander's Conquest (in:) Greek Colonists and Native Populations. Proceedings of the First Australian Congress of Classical Archaeology, Sydney 1985, ed.J.-P. D e s c o e u d r e s, Canberra - Oxford 1990, pp.323 - 328.

4. Cf. J. W o l s k i, The Decay of the Iranian Empire of the Seleucids and the Chronology of the Parthian Beginnings, Berytus XII, fasc.1, 1958, pp. 35 - 52; i d e m, Der Zusammenbruch der Seleukidenherrschaft im Iran im 3. Jahrhundert v. Chr. (in:) Der Hellenismus in Mittelasien, ed F. A l t h e i m and J. R e h o r k, Darmstadt 1969, pp. 188 - 254; K. S c h i p p m a n n, Grundzüge der parthischen Geschichte, Darmstadt 1980; A. D. H. B i v a r, The Political History of Iran under the Arsacids (in:) The Cambridge History of Iran, vol. 3(1), Cambridge 1983, p.21ff; R. N. F r y e, op. cit., p. 205ff.

5. Cf. R. N. F r y e, op. cit., pp.162 - 163 and 171ff.

6. See, among others; W. W. T a r n, op. cit.; J. W o l s k i, Le problème de la fondation de l'Etat gréco - bactrien, Iranica Antiqua XVII 1982, pp.131 - 146; F. L. H o l t, Alexander the Great and Bactria. The Formation of a Greek Frontier in Central Asia, Leiden 1988 (= Mnemosyne, Suppl. 104).

7. Cf. J. W o l s k i, Les sources de l'époque hellénistique et parthe d'Iran. Difficulté de leur interprétation et problèmes de leur évaluation (in:) From Hecataeus to al - Huwārizmī. Collection of the Sources for the History of Pre - Islamic Central Asia. Series I. Volume III. Ed. by J. H a r m a t t a, Budapest 1984, pp. 137 - 145; A. K u h r t, S. S h e r w i n - W h i t e, Seleukidy i severo - vostočnyi Iran v III v. do n. e. (in:) Mery v drevnei i srednevekovoj istorii Vostoka, Ashgabad 1991, p.24.

8. For example, see the following: F. E. W i n t e r, Greek fortifications, Toronto 1971; Y. G a r i a n, Recherches du poliorcétique grecque, Paris 1974; A. W. L a w r e n c e, Greek Aims in Fortification, Oxford 1979; A. M c N i c o l l, Developments in Techniques of Siegecraft and Fortification in the Greek World ca. 400 - 100 B. C. (in:) La fortification dans l'histoire du monde grecque. Actes du Colloque International "La fortification et sa place dans l'histoire politique, culturelle et sociale du monde grecque, Valbonne 1982, ed. P. L e r i c h e, H. T r e z i n y, Paris 1986, pp. 305 - 313.

9. Cf. G. K o c h e l e n k o, La fortification de l'Orient hellénistique: remarques préliminaires (in:) La fortification..., pp. 143 - 148; P. L e r i c h e, Fortifications grecques: bilan de la Recherche au Proche et Moyen Orient (in:) La fortification..., pp. 39 - 49. For the most impressive discoveries at Ai Khanum, see P. L e r i c h e, Fouilles d'Aï Khanoum. V. Les remparts et les monuments associés, Paris 1986 (= Mémoires de la Délégation Archéologique Française en Afghanistan XXIX).

10. Cf. V. L. V o r o n i n a, Iz istorii sredneaziatskoj fortifikacii, Sovetskaja archeologija 1964, 2, pp. 40 - 54; K. S. S a b i r o v, Oboronitelnye sooruzhenija drevnich poselenij i gorodov Srednej Azii, Moscow 1979 (avtoreferat dissertacii kand. ist. nauk); H. P. F r a n c f o r t, Les fortifications en Asie centrale de l'âge du bronze à l'époque kouchanne, Paris 1979; M. T u r e b e k o v, Oboronitelnye sooruzhenija drevnich poselenij i gorodov Sogda, Moscow 1981 (avtoreferat dissertacii kand. ist. nauk); G. C h o d ž a n i j a z o v, Istorija razvitiia fortifikacii antičnogo Choresma, Sovetskaja archeologija 1981, 2, pp. 43 - 56; E. V. R t v e l a d z e, Bactrian Fortification. Genesis and Evolution in their Social and Cultural Aspect (in:) La fortification..., pp. 323 - 328; G. A. P o u g a t c h e n k o v a, Caracteres de l'architecture défensive antique en Asie Centrale (in:) La fortification..., pp. 57 - 69.

11. For details consult: G. A. P u g a č e n k o v a, Parfijskie kreposti južnogo Turkmenistana, Vestnik drevnej istorii 1952, 2, pp. 215 - 225; e a d e m, Puti razvitiia architektury južnogo Turkmenistana pory rabovladienija i feodalizma, Moscow 1958 (= Trudy Južno - Turkmenistanskoj Archeologičeskoj Kompleksnoj Ekspedicii [quoted below as TJuTAKB], vol. VIII); G. A. K o č -

e i e n k o, Parfijskaja fortifikacija; M. O p p e r m a n n, Beiträge zur parthischen Sakral- und Festungs Architektur am Beispiel der Grabungsergebnisse in Nisa, Wissenschaftliche Zeitschrift der Martin - Luther - Universität, Halle - Wittenberg, Gesellschafts- und Sprachwissenschaftliche Reihe XVII 1968, H.6, pp. 43 - 115; H. P. F r a n c f o r t, op. cit.; M. Y. K i a n i, op. cit. Cf. also my M.A. thesis (see note 1).

12. Cf. J u s t i n XLI 5, and A m m i a n u s M a r c e l l i n u s XXIII 6,4.

13. There are very close similarities in the development of the Arsacid and Kushan kingdoms in this respect.

14. P o l y b i u s, The Histories X 31, transi. W.R. Paton, London 1954.

15. Cf. P h i l o of B y z a n t i u m (in:) A. W. L a w r e n c e, op. cit., pp. 67 - 107 (see especially chapter I 69 - 78).

16. Cf. F. E. W i n t e r, Greek fortifications, p. 275, note 19 and p.330.

17. W. W. T a r n, op. cit., pp.20 - 21.

18. J. H a n s m a n, D. S t r o n a c h, Excavations at Shahr-i Qumis 1967, Journal of the Royal Asiatic Society 1970, p.36ff.

19. Cf. K. J e p p e s e n, A Hellenistic Fortress on the Island of Ikaros (Failaka) in the Persian Gulf (in:) Actes de VIII^e Congrès International d'Archéologie classique " Le rayonnement des civilisations Grecque et Romaine sur les cultures peripheriques " (Paris 1963), Paris 1965, pp. 541 - 544; A. W. L a w r e n c e, op. cit., pp. 178 - 179.

20. See Drevnejšie gosudarstva Kavkaza i Srednej Azii, ed. G. A. K o ŝ e i - e n k o, Moscow 1985, pp.182 - 185 and 228.

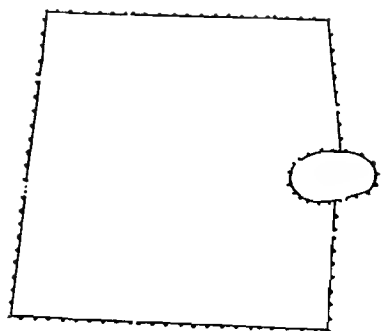
21. ibidem, pl.LXXIII.

22. Cf. G. A. Košelenko, Rodina..., p.41.
23. Cf. M. I. Piliánovič, Glaur-kala (in:) TJuTAKE, vol.XV Ashgabad 1974, pp.15 - 139.
24. In Margiana, the plan of Kyrk-depe presents the closest analogy - but the date of the town is disputable, see Drevneštie gosudarstva, pp.229 and 232. Compare also the plan of Berola in Syria (J. G r a l n e r, The Cities of Seleucid Syria, Oxford 1990, pp. 61 and 79 - 80).
25. V. N. Piličko, Issledovanie pamiatnikov antičnogo vremeni v rajone Geok-Tepe (in:) Karakumskie drevnosti, vol.I, Ashgabad 1968, pp. 34 -35.
26. Cf. Drevneštie gosudarstva..., p. 213 and pl. LXXIII.
27. Cf. M. Y. K l a n i, op. cit., pp.42 - 43 and 56 - 59.
28. ibidem, p.15 (fig. 9).
29. See; G. A. P u g a č e n k o v a, K interpretaciji nekotorych arhitekturnych pamiatnikov Merva i Nisy (in:) TJuTAKE, vol. XVI, Ashgabad 1978, pp.16 - 30; V. S. D o l g o r u k o v, Oboroniteinye sooruzhenija Dilberdžina (in:) Drevnjaja Baktrija. Moscow 1984 (= Materialy Sovetsko - Afganskoj archeologičeskoj ekspedicii, vol. 3), pp. 85 - 86.
30. Cf. D. H u f f, Zur Datierung des Alexandervalls, Iranica Antiqua 16, 1981, pp. 125 - 139; M. Y. K l a n i, Excavations on the Defensive Wall of the Gurgan Plain: a Preliminary Report, Iran 20, 1982, pp. 73 - 79; M. C h a r - l e s w o r t h, Preliminary Report on a Newly - Discovered Extension of "Alexander's Wall", Iran 25, 1987, pp. 160 - 165.
31. Cf. L. N. M e r e ž i n, Obsledovanie raionnoj steny III v. do .n.e. vokrug Margiany (in:) TJuTAKE, vol. XVI, Ashgabad 1978, pp. 11 - 15. There are remarkable similarities between the Antiochus' Wall and the Ptolemaic walls in Egypt. For these walls, see A. W. L a w r e n c e, op. cit., pp. 171 - 172.

32. For details see: N. S. G r a ž d a n k i n a, Drevnie stroitelnye materialy Turkmenii (in:) TJuTAKE, vol. VIII, Ashgabad 1958, p. 11 ff; J. H a n s m a n, D. S t r o n a c h, op.cit., p. 32 ff; M. Y. K i a n i, Parthian Sites..., pp.48 - 53; Drevneiše gosudarstva..., p. 216.
33. Cf. P. L e r i c h e, O. C a l l o t, Observations sur les remparts de brique crue d'Aï Khanoum et de Doura Europos (in:) La fortification..., pp. 291 - 292.
34. Cf. Drevneiše gosudarstva..., p. 230.
35. A. W. L a w r e n c e, op. cit., p. 211.
36. M. A. R. C o l l e d g e, The Parthian Art, London 1977, p. 25 ff.
37. M. I. F i l a n o v i č, op. cit., p. 38.
38. G. A. P u g a č e n k o v a, Parfijskie kreposti..., p. 219.
39. A. W. L a w r e n c e, op. cit., p. 281ff and fig. 50.
40. S. S. T a š c h o d ž a e v, Razrez gorodskoj steny Giaur-kaly (in:) TJuTAKE, vol. XII, Ashgabad 1963, p. 104.
41. Cf. Daiverzintepa - kušanskij gorod na juge Uzbekistana, Tashkent 1978, p.18.
42. Cf. F. E. W i n t e r, op.cit., pp.327 - 328; A. W. L a w r e n c e, op. cit. p. 385ff.
43. G. A. P u g a č e n k o v a, K charakteristike krepostnoj architektury Staroi Nisy, Izvestija Akademii nauk Turkmenskoj SSR, Serija obščestvennyh nauk 1952, 1, p.17. Similar towers were unearthed in Bactrian Kej-kobad-šach, see A. M. M a n d e l š t a m, B. B. N e v z n e r, Raboty Kafirniganskogo otriada v 1952 - 1953 gg. (in:) Materialy i issledovanija po archeologii SSSR, no.66, Moscow - Leningrad 1958, p.293.

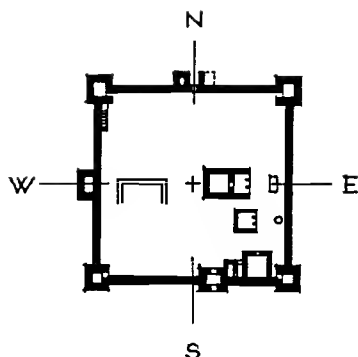
44. A. W. L a w r e n c e, op. cit., pp. 47 - 48.
45. G. A. P u g a Ć e n k o v a, op. cit., p.17.
46. G. A. K o Ĺ e l e n k o, Parfiaskaia fortifikacija, pp. 62 - 63. On the debatable date of Durnali, see: A. G u b a e v, Novye archeologiĉeskie dannye o kreposti Ć ilburdĹ (in:) Problemy archeologii Turkmenistana, Ashgabad 1984, pp.95 - 106.
47. G. A. K o Ĺ e l e n k o, op. cit. p.63.
48. DrevnejĹie gosudarstva..., p. 231
49. V. N. P i l i p k o, op. cit., p.34.
50. G. A. P u g a Ć e n k o v a, Puti razvitiia...,p.45.
51. P h i l o o f B y z a n t i u m I 52.
52. G. A. P u g a Ć e n k o v a, K karakteristike..., pp.18 - 19.
53. e a d e m, Puti razvitiia..., p.40.
54. DrevnejĹie gosudarstva..., p. 237; V. P. N i k o n o r o v, VooruĹenie i voennoe delo v Parfii, Leningrad 1987 (avtoreferat dissertacii),pp.12-13.
55. Cf. F. E. W i n t e r, op. cit., p. 325.
56. Compare Durnali in Margiana, Qaleh Gabri in central Iran (W. K l e i s s, Parthische Militärarchitektur in Iran (in:) Akten des XIII. Internationalen Kongresses für Klassische Archäologie (Berlin 1988) Mainz 1990, pp.326 - 328) and Khirbet Jaddalah in Mesopotamia (G. B e r g a - m i n i, Parthian Fortifications in Mesopotamia, Mesopotamia XXII 1987,pp.201 - 203). On archers in the fortifications' defence:V.P. N i k o n o r o v, op.cit., p. 20.

PL. I

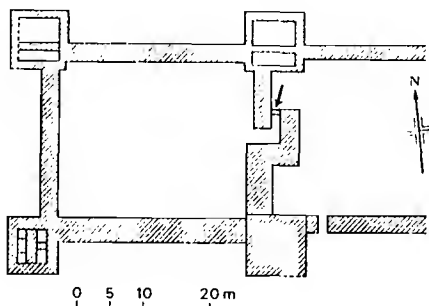


0 100 500

a) Beroia (Syria), schematic plan. After N. Saliby, *Découverte d'une partie du rempart antique d'Alep* (in:) *La fortification dans l'histoire du monde grecque...*, Fig. 248.

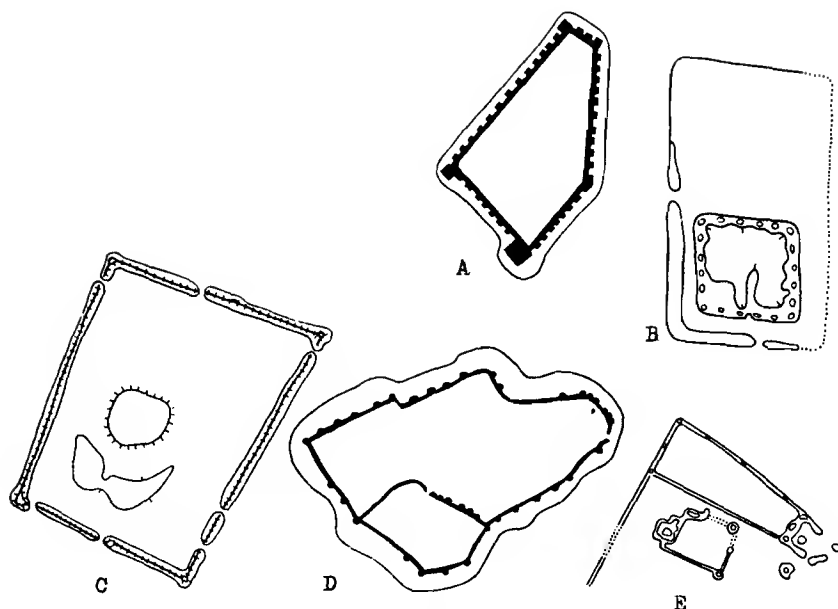


b) Hellenistic fortress of Ikaros (Failaka). After K. Jeppesen, *A Hellenistic Fortress on the Island of Ikaros (Failaka) in the Persian Gulf* (in:) *Le rayonnement des civilisations grecque...*, Fig. 1, p. 542.



c) Fort at Theangela (Caria), plan. After A. W. Lawrence, *Greek Aims...*, Fig. 31, p. 179.

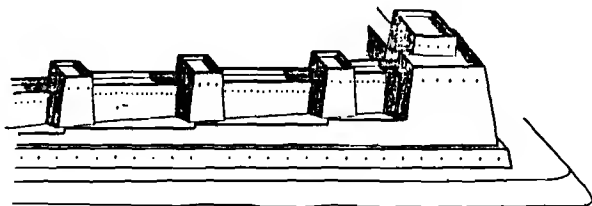
PL. II



a) Parthian cities and strongholds: A-Old Nisa; B-Dengil-depe; C-Kunja-Kaachka; D-New Nisa; E-Mansur-depe. After Drevnejšie gosudarstva..., Pl. LXXIII.

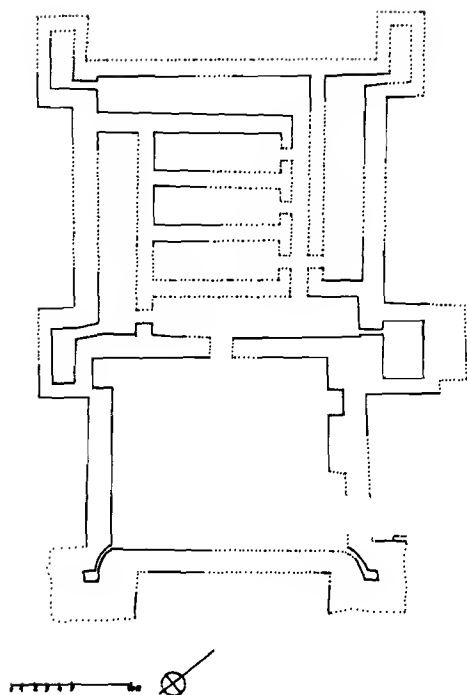


b) Old Nisa, view from northwest, reconstruction. After G. A. Pugačenkova, Puti razvitiya architektury..., p. 32.

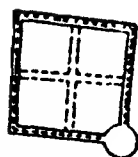


c) Old Nisa, ramp and entrance, reconstruction. After G. A. Pugačenkova, Puti razvitiya architektury..., p. 35.

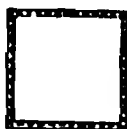
PL. III



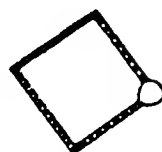
a) Parthian fort at Shahr-i Qūmis (Hecatompylos), plan. After J. Hansman, D. Stronach, Excavations at Shahr-i Qūmis, 1967, Fig. 3, p. 37.



Q_KHARABEH



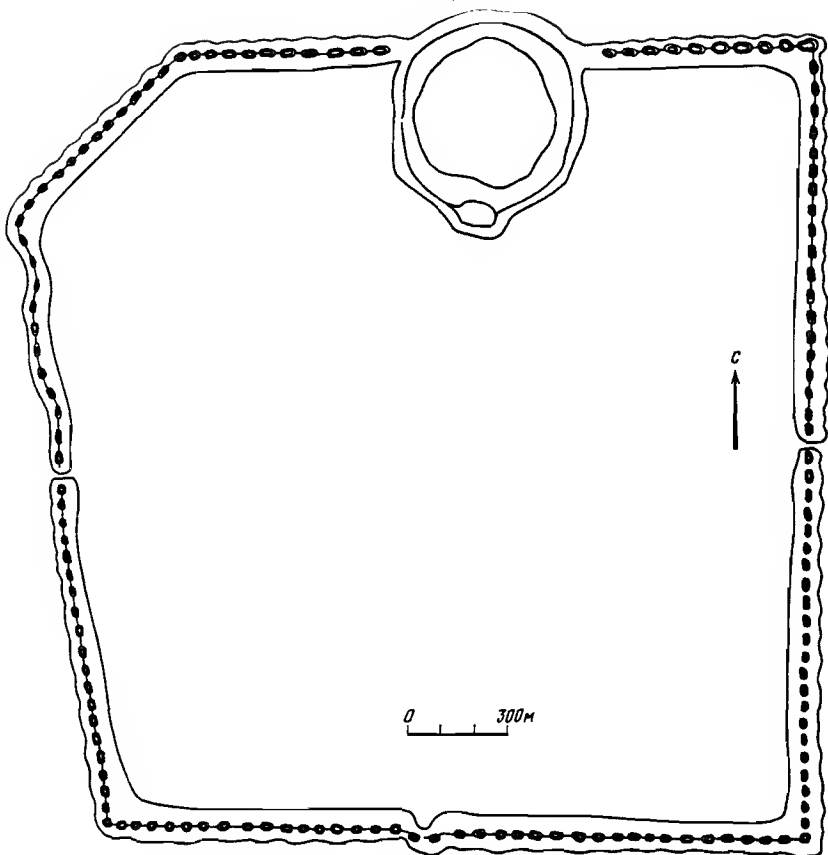
Q_DALAND



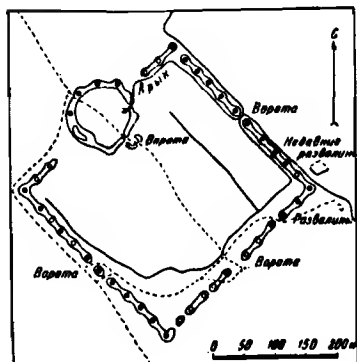
Q_GABRI

b) Parthian cities of Hyrcania, schematic plans. After M. Y. Kiani, Parthian Sites in Hyrcania..., Fig. 30-31.

PL. IV

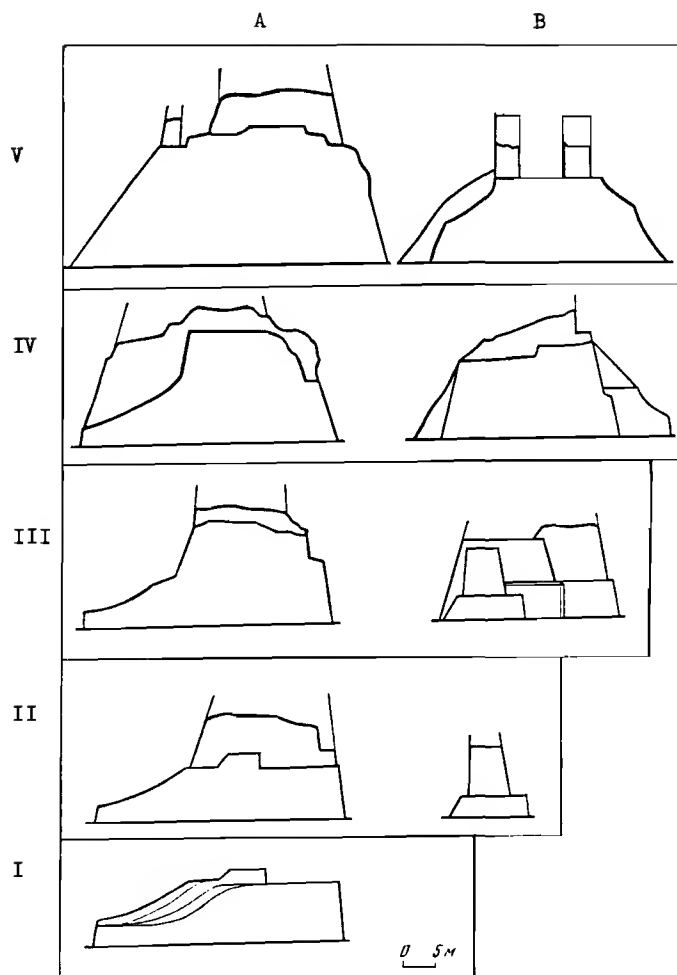


a) Ancient Merv, schematic plan.
After Drevnejšie gosudarstva...,
Pl.XC, p.378.



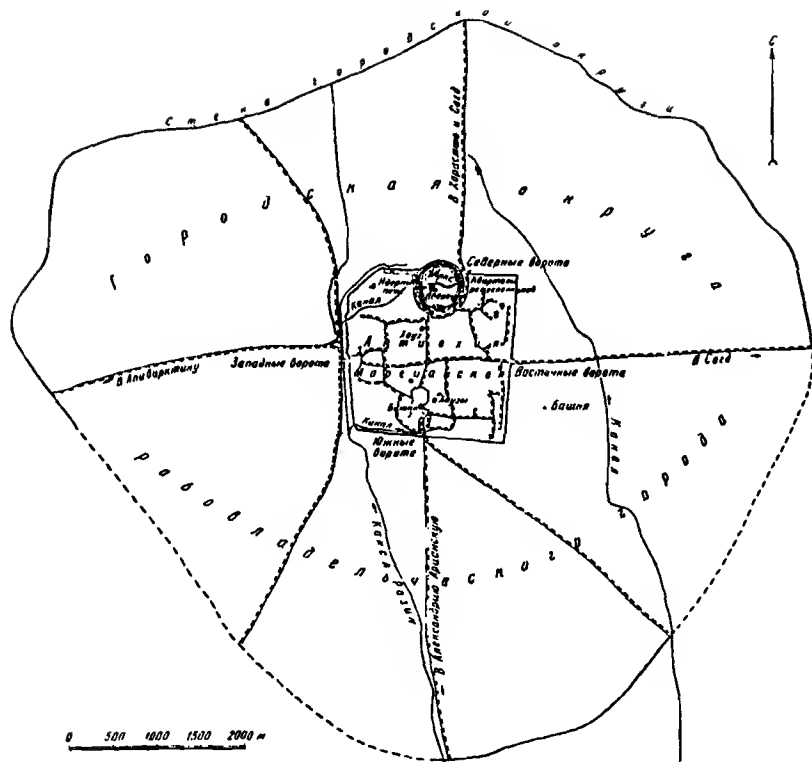
b) Kyrk-depe (Margiana), plan.
After G.A.Pugačenkova, Puti
razvitiya architektury...,
p.41.

PL. V

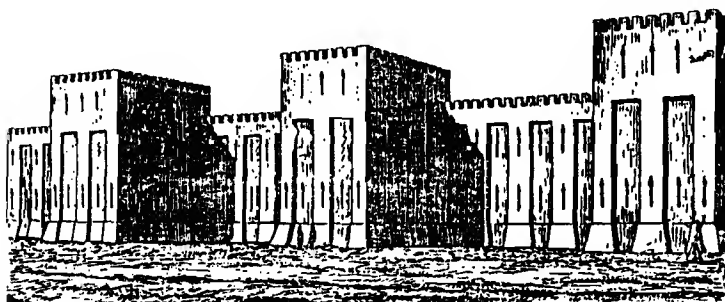


Merv, the development of the city defences. A - Erk-kala, B - Gjaur-kala. Phases: I - 5th century B.C.; II - 3rd century B.C.; III - 3rd-2nd centuries B.C.; IV - 1st-2nd centuries A.D.; V - 3rd-4th centuries A.D.; After Drevnejšie gosudarstva..., Pl XCI, p. 379.

PL. VI

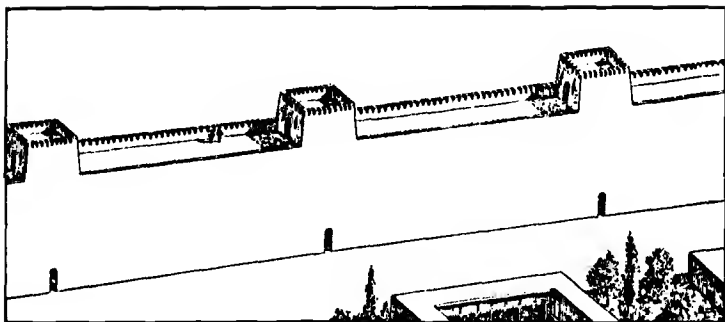


a) Ancient Merv, plan of city. After G.A. Pugačenkova, *Puti razvitiya architektury...*, p.42.

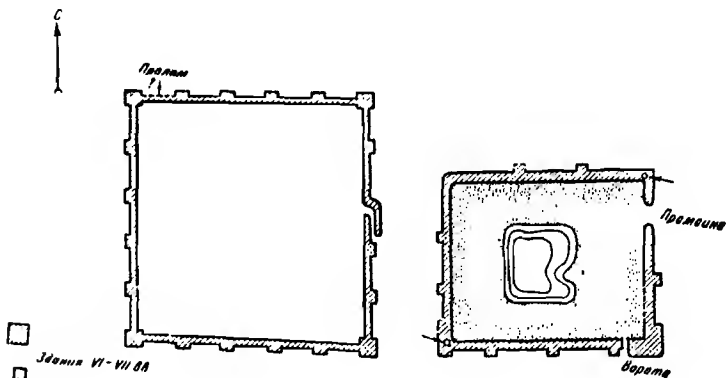


b) Durnali (Margiana), fortifications. Reconstruction after G.A. Pugačenkova, *Puti razvitiya architektury...*, p.50.

PL. VIII



a) Ancient Merv, the city walls. Reconstruction. After G.A.Pugačenkova, Puti razvitiya architektury..., p.43.



A

B

b) Parthian fortresses in Margiana, plans: A - Сычаньк, B - Акча-депе. After G.A.Pugačenkova, Puti razvitiya architektury..., p.46.